FIG. 1A

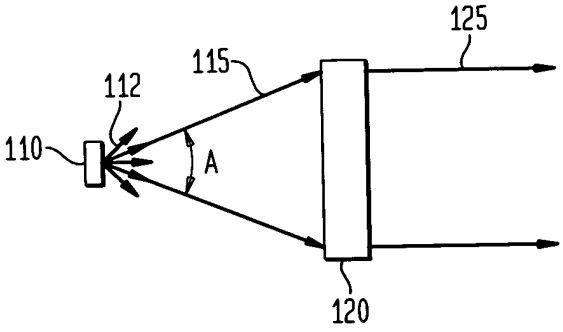


FIG. 1B
(PRIOR ART)
COLL ONLY

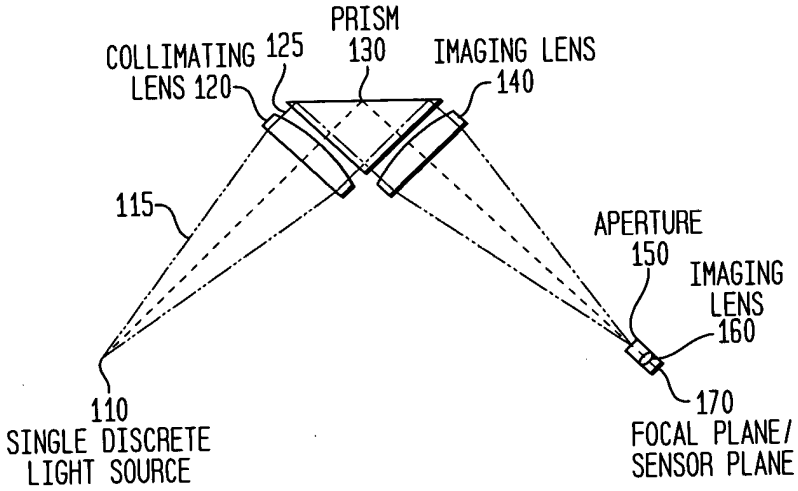


FIG. 2
(PRIOR ART)
DIFF ONLY

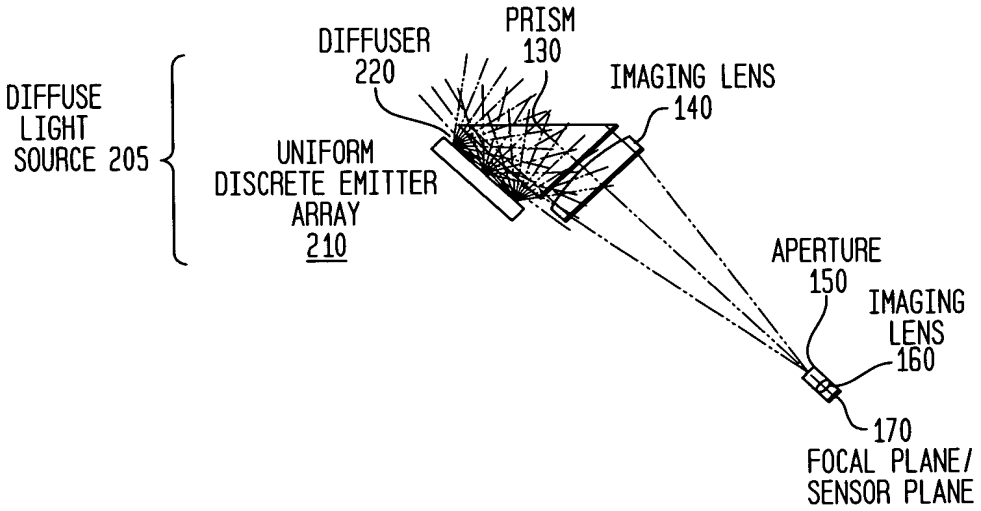


FIG. 3A
INVENTION HYBRID ILLUM.

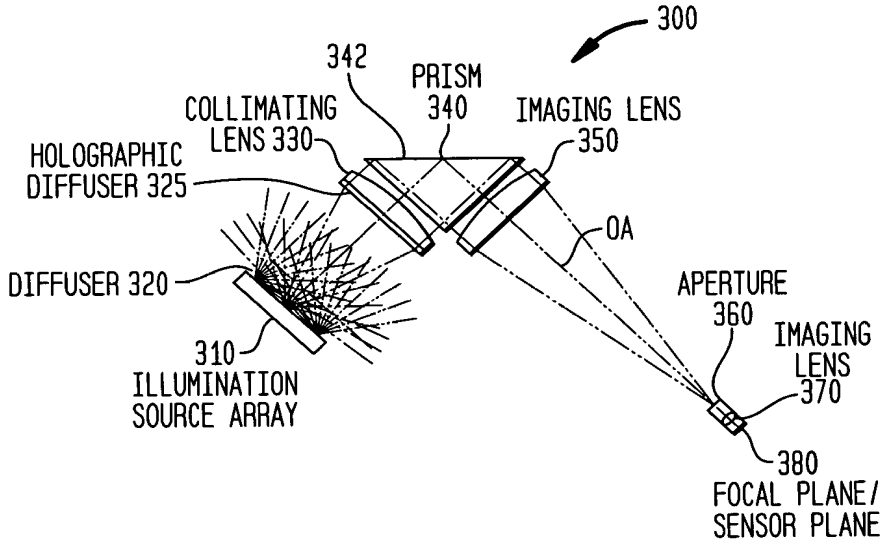


FIG. 3B

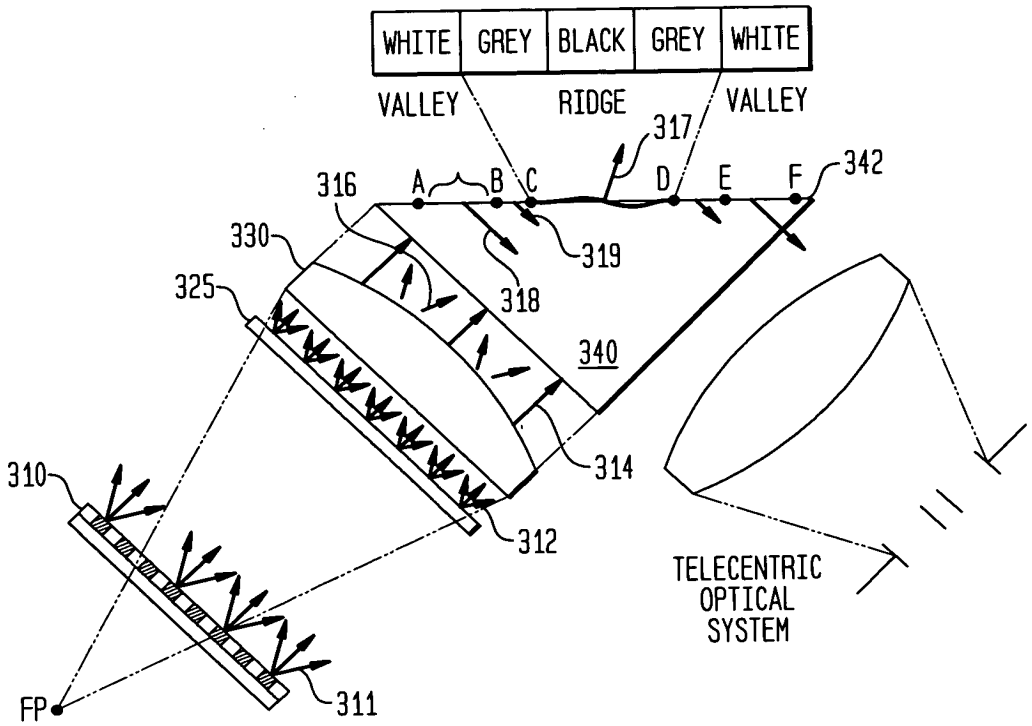

WHITE
GREY
BLACK
GREY
WHITE
VALLEY
RIDGE
VALLEY
317
316
A
B
C
D
E
F
342
330
319
318
325
340
314
310
312
TELECENTRIC
OPTICAL
SYSTEM
FP
311

FIG. 3C

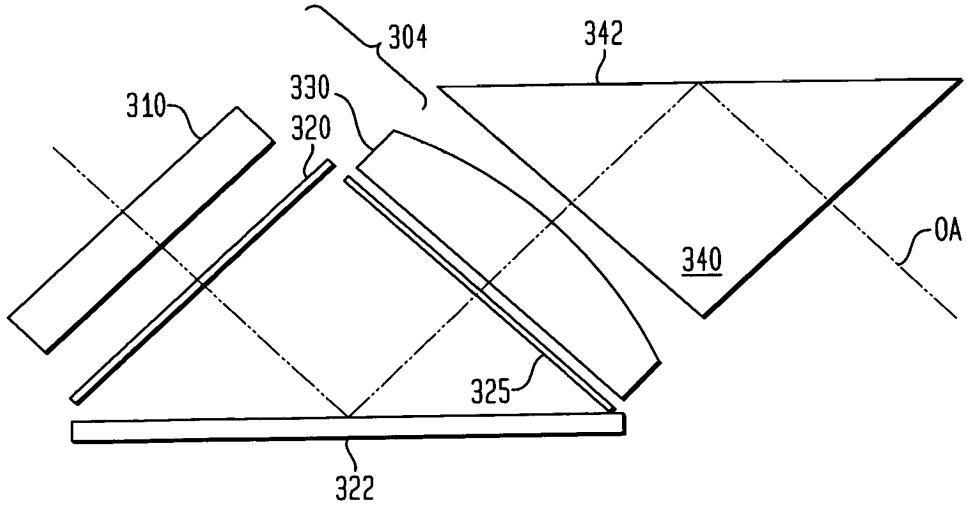

304
342
330
310
320
340
OA
325
322

FIG. 4

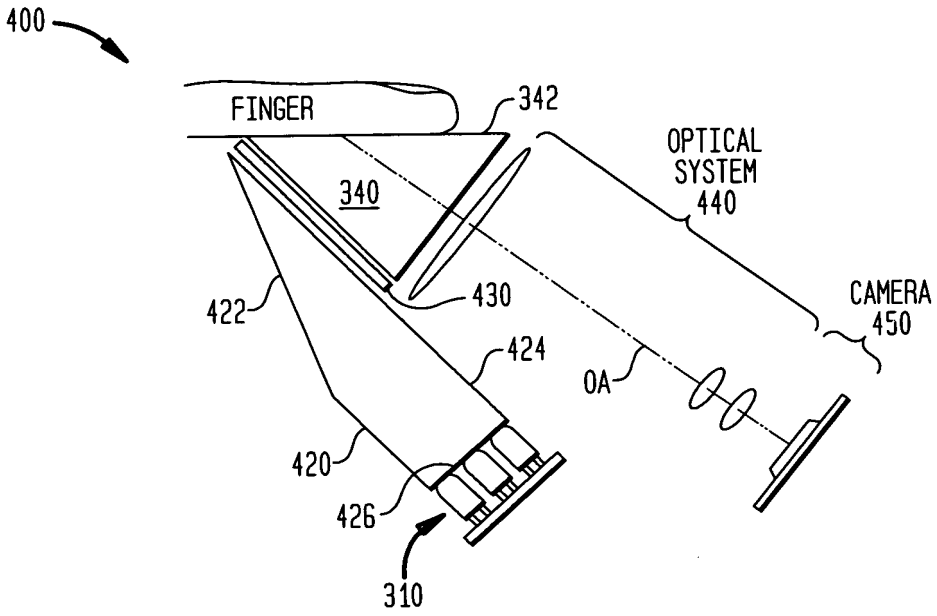


FIG. 5

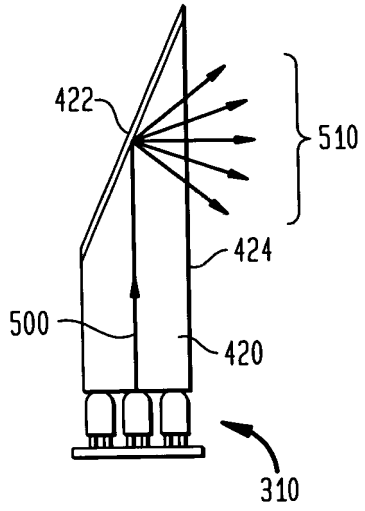


FIG. 6A

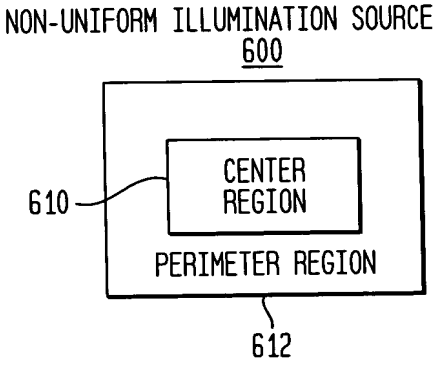

NON-UNIFORM ILLUMINATION SOURCE ARRAY
600
CENTER REGION
610
PERIMETER REGION
612

FIG. 6C

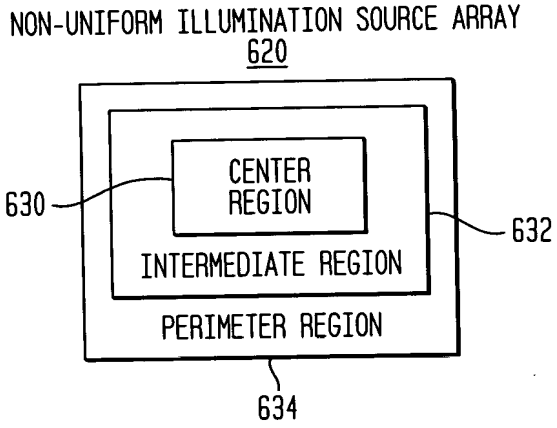
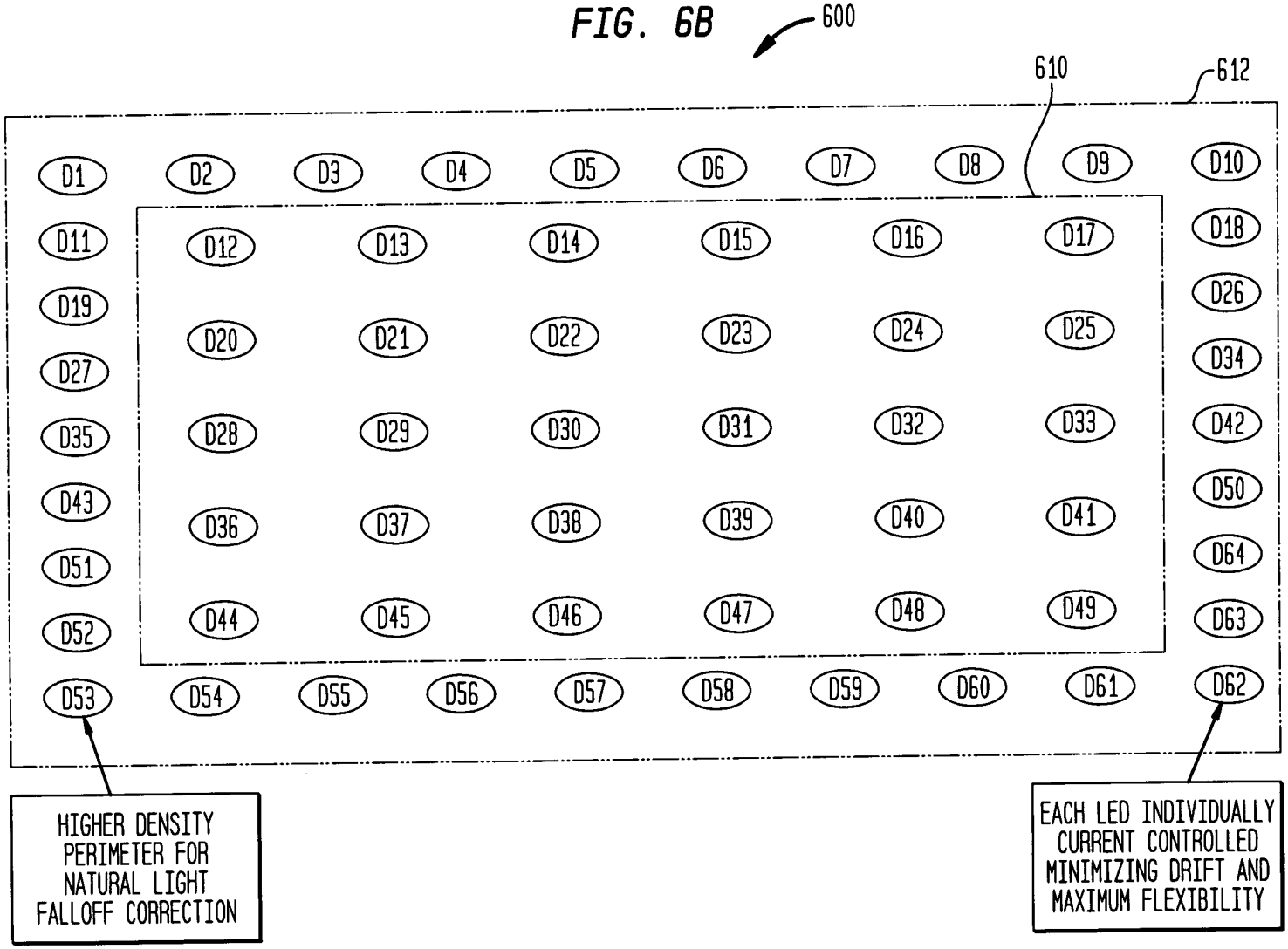

NON-UNIFORM ILLUMINATION SOURCE ARRAY
620
CENTER REGION
630
INTERMEDIATE REGION
632
PERIMETER REGION
634

FIG. 6B


600
610
612
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
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D25
D26
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D29
D30
D31
D32
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D35
D36
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D42
D43
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D45
D46
D47
D48
D49
D50
D51
D52
D53
D54
D55
D56
D57
D58
D59
D60
D61
D62
D63
D64
HIGHER DENSITY PERIMETER FOR NATURAL LIGHT FALLOFF CORRECTION
EACH LED INDIVIDUALLY CURRENT CONTROLLED MINIMIZING DRIFT AND MAXIMUM FLEXIBILITY

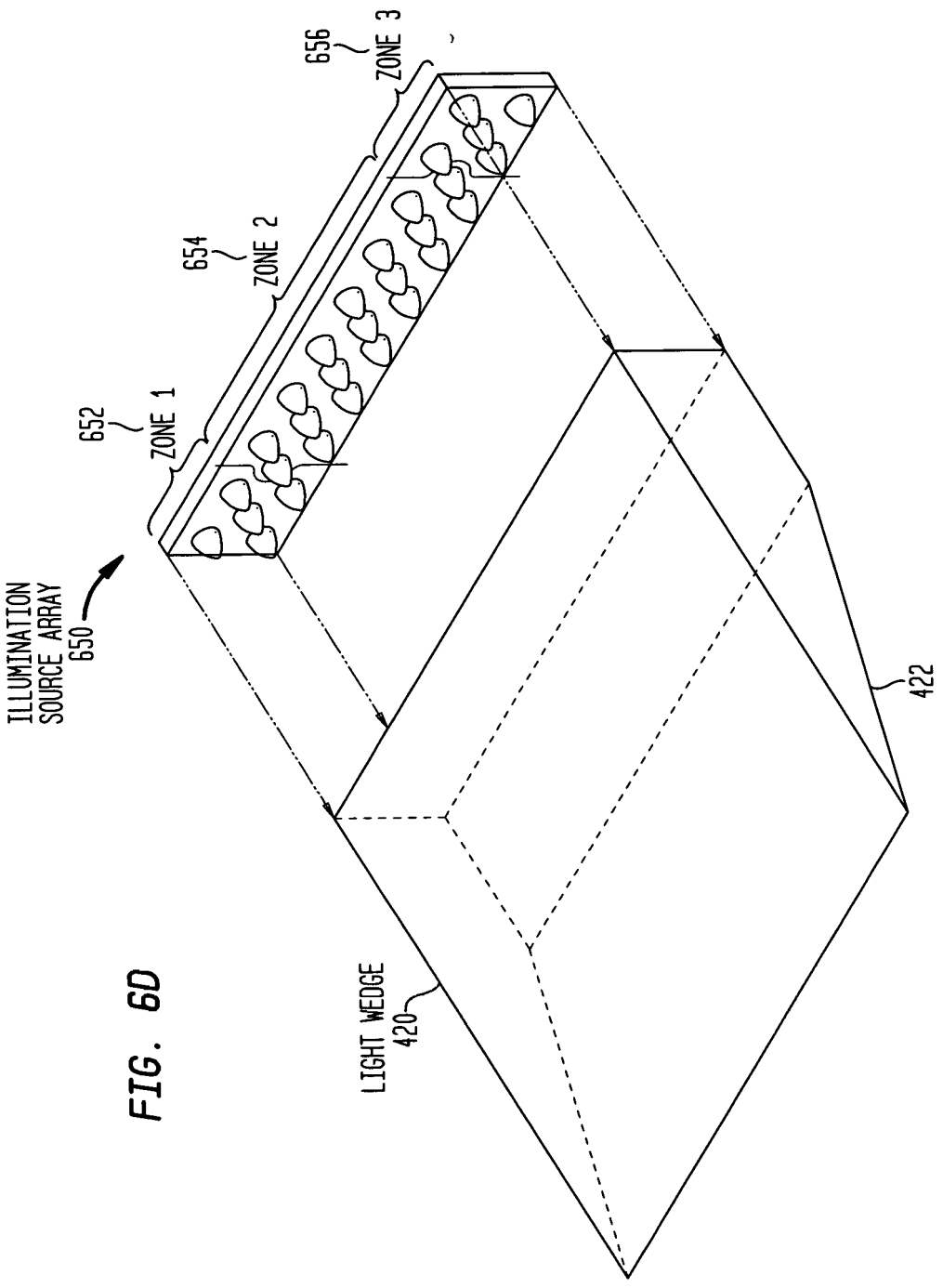

ILLUMINATION SOURCE ARRAY 650
652 ZONE 1
654 ZONE 2
656 ZONE 3
LIGHT WEDGE 420
422

FIG. 6D

FIG. 7

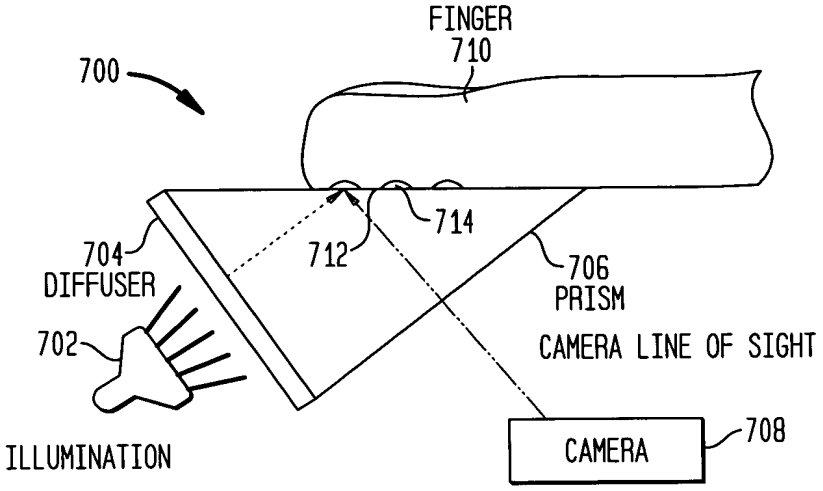
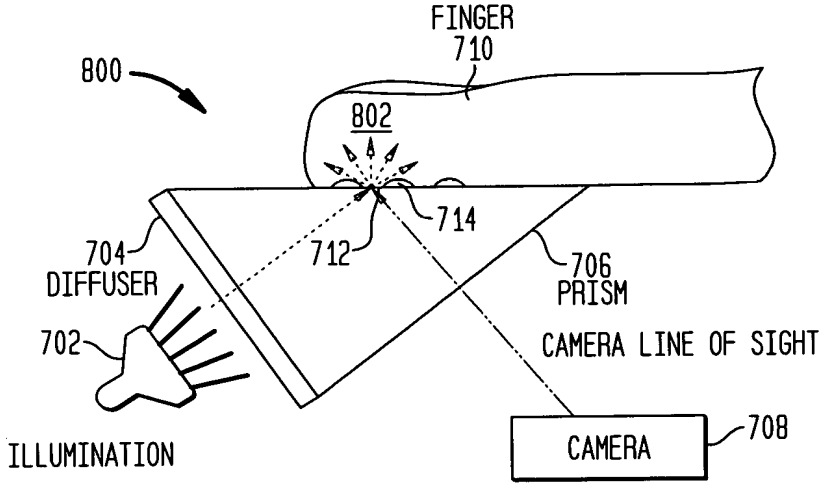

FINGER
710
700
714
704
DIFFUSER
712
706
PRISM
702
CAMERA LINE OF SIGHT
ILLUMINATION
CAMERA
708

FIG. 8


FINGER
710
800
802
714
704
DIFFUSER
712
706
PRISM
702
CAMERA LINE OF SIGHT
ILLUMINATION
CAMERA
708

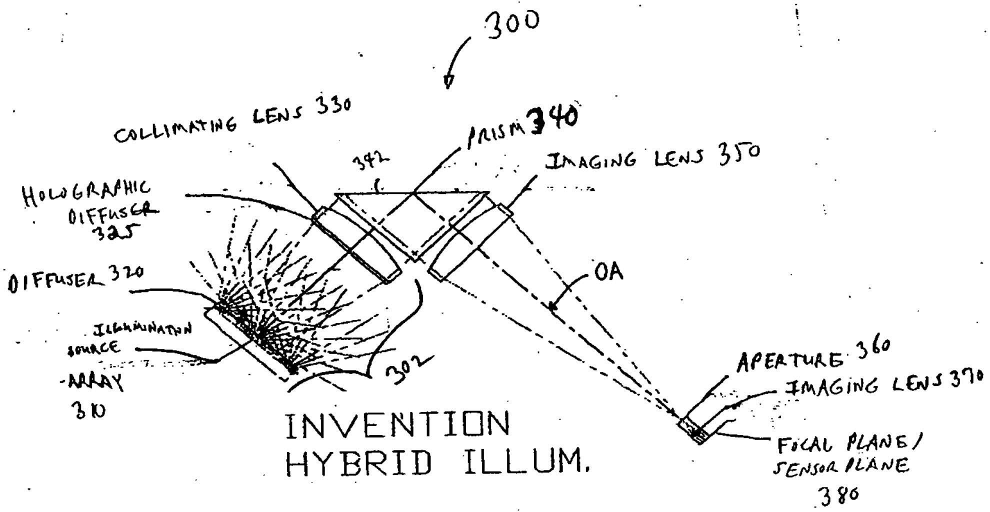

300
COLLIMATING LENS 330
PRISM 340
342
IMAGING LENS 350
HOLOGRAPHIC DIFFUSER 325
DIFFUSER 320
ILLUMINATION SOURCE ARRAY 310
302
OA
APERTURE 360
IMAGING LENS 370
FOCAL PLANE / SENSOR PLANE 380
INVENTION HYBRID ILLUM.

FIG. 3A

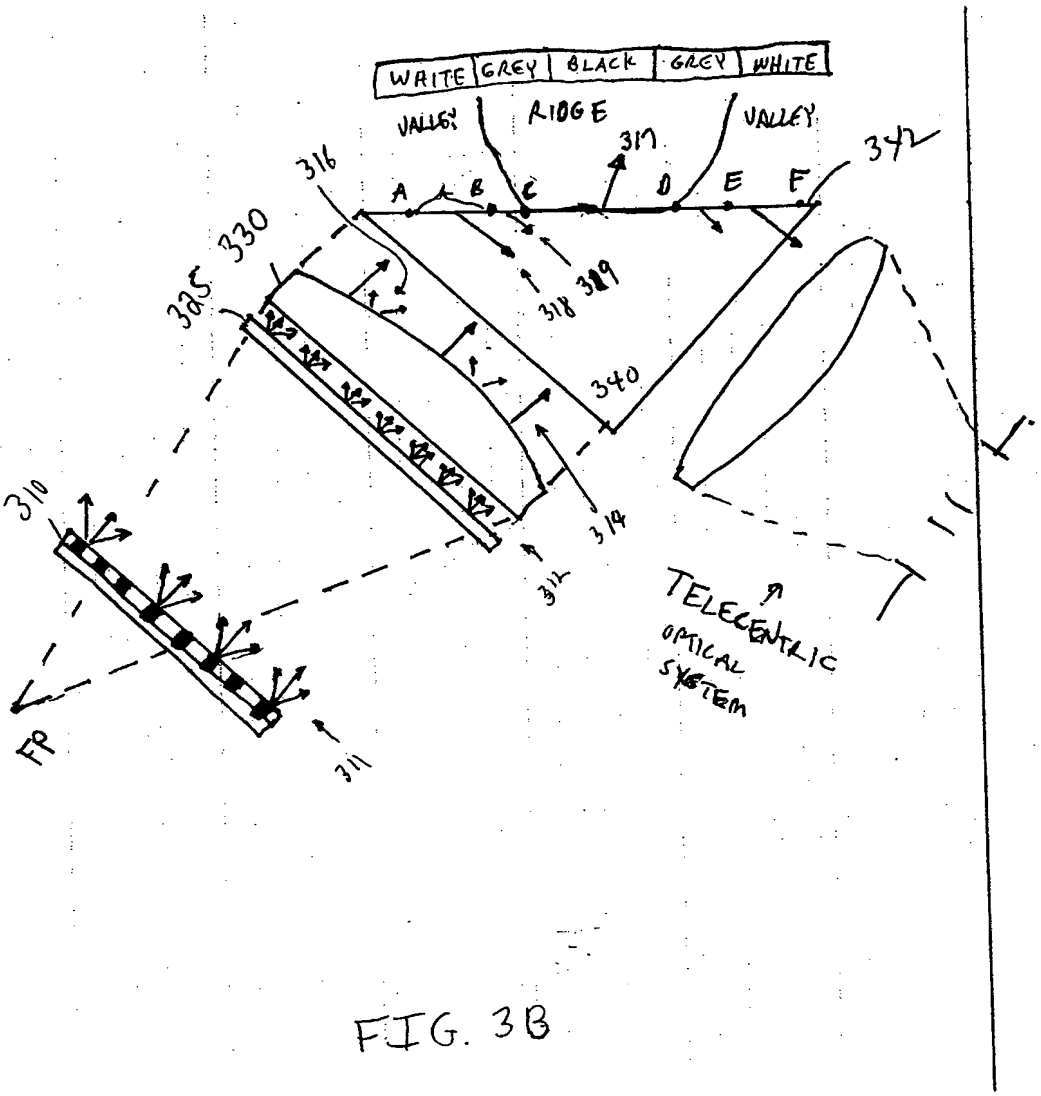

WHITE
GREY
BLACK
GREY
WHITE
VALLEY
RIDGE
VALLEY
316
317
342
A
B
C
D
E
F
330
325
318
319
340
310
314
312
TELECENTRIC
OPTICAL
SYSTEM
FP
311

FIG. 3B

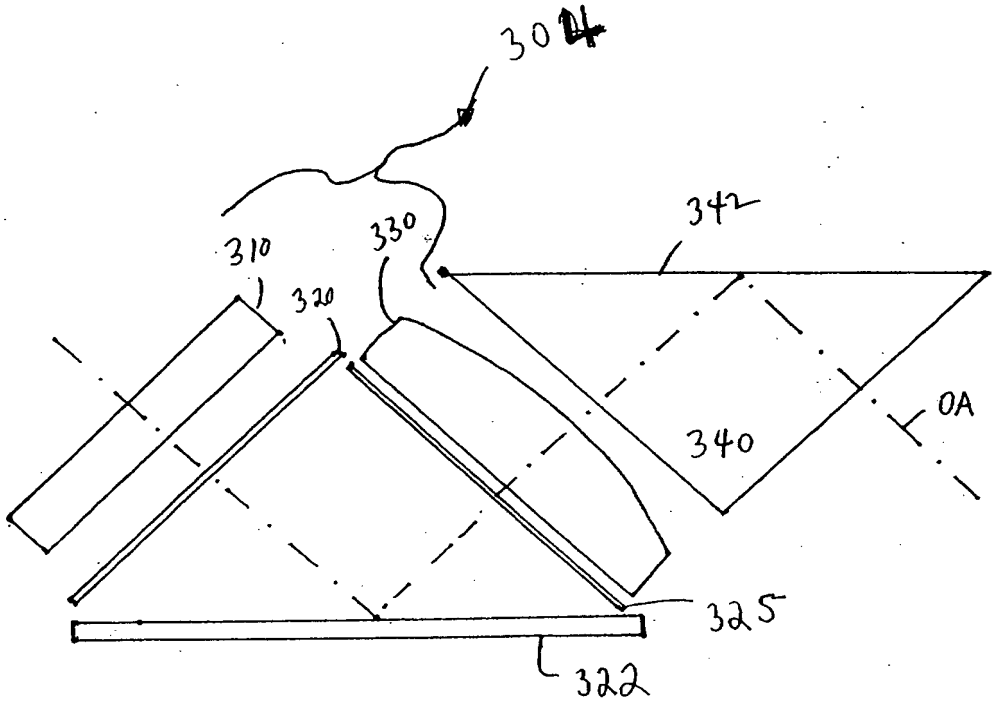


FIG. 3C

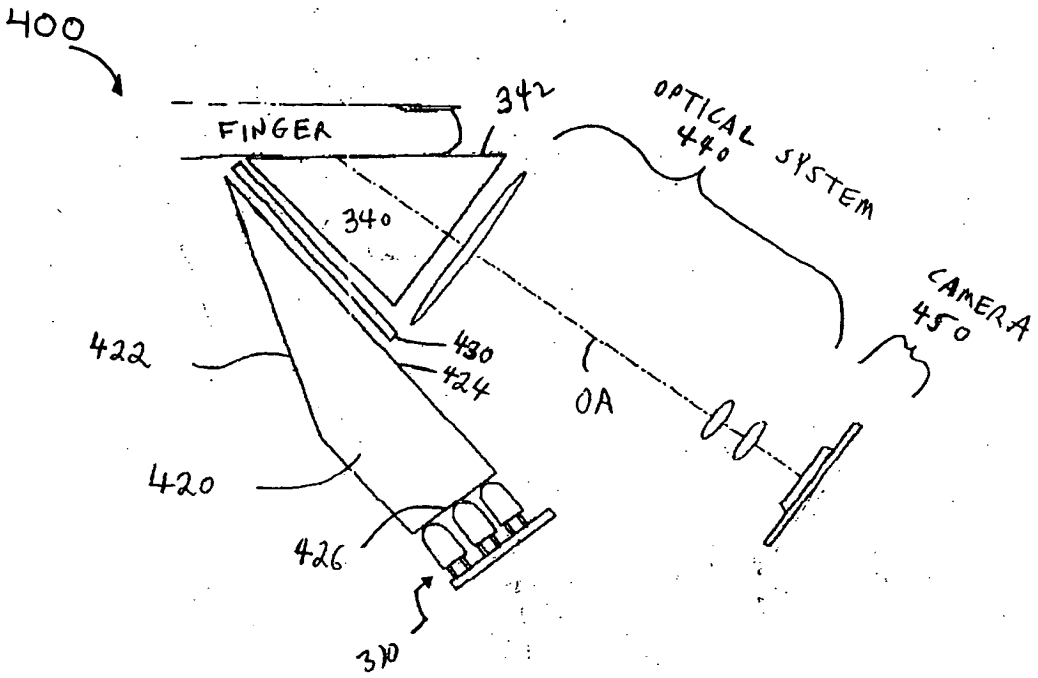

400
FINGER
342
OPTICAL SYSTEM
440
340
CAMERA
450
422
430
424
OA
420
426
310

FIG. 4

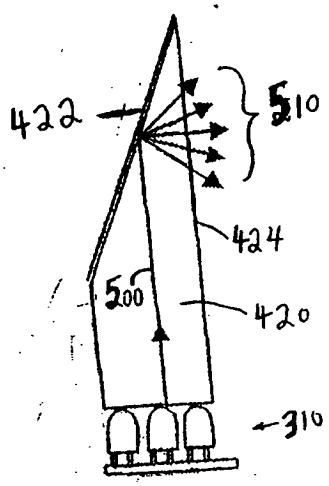


FIG. 5

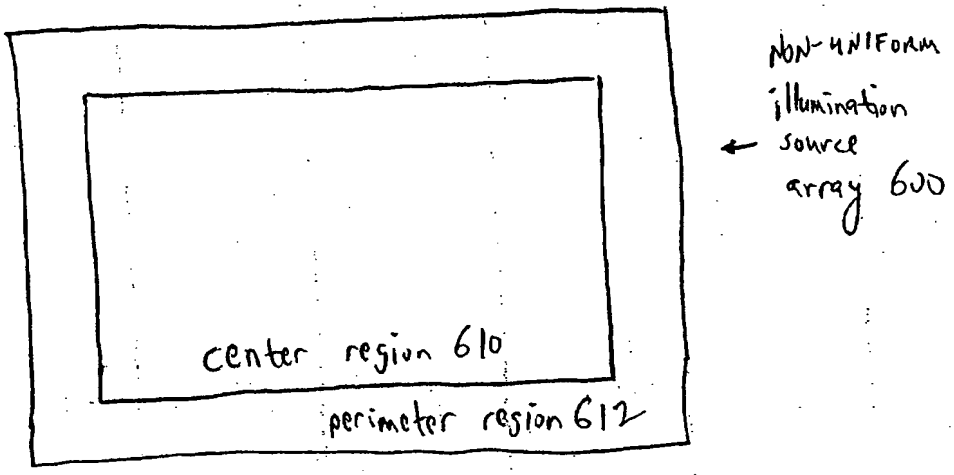

center region 610
perimeter region 612
NON-UNIFORM
illumination
source
array 600

FIG. 6A

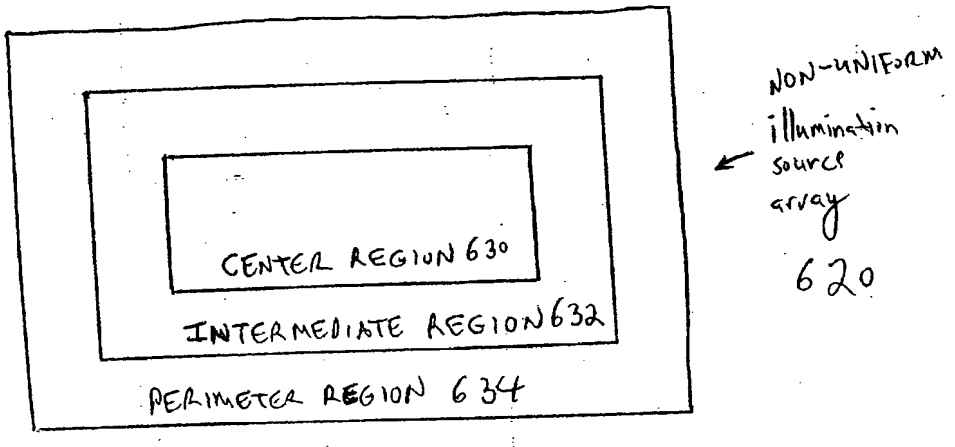

CENTER REGION 630
INTERMEDIATE REGION 632
PERIMETER REGION 634
NON-UNIFORM
illumination
source
array
620

FIG. 6B

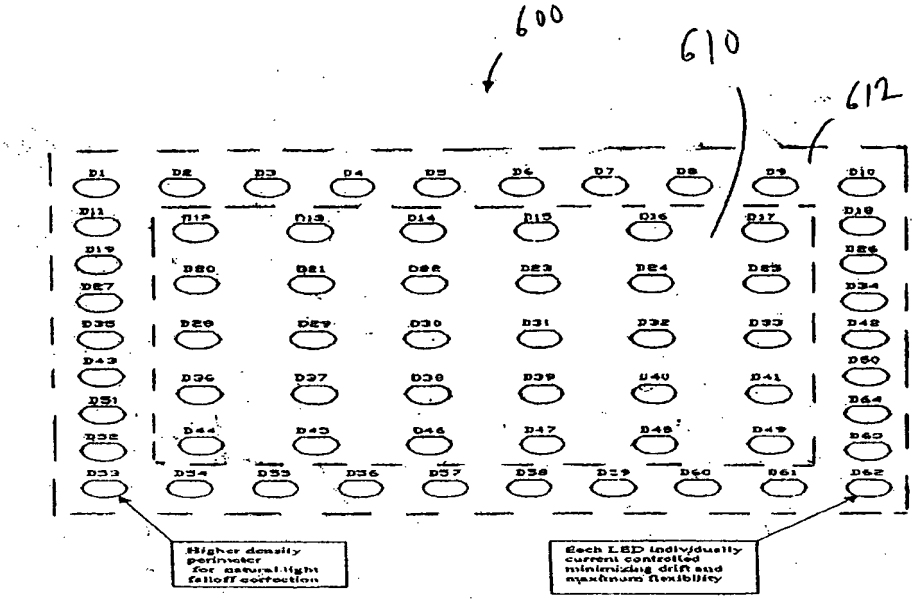

600
610
612
Higher density perimeter for natural light falloff correction
Each LED individually current controlled minimizing drift and maximum flexibility

FIG. 6B

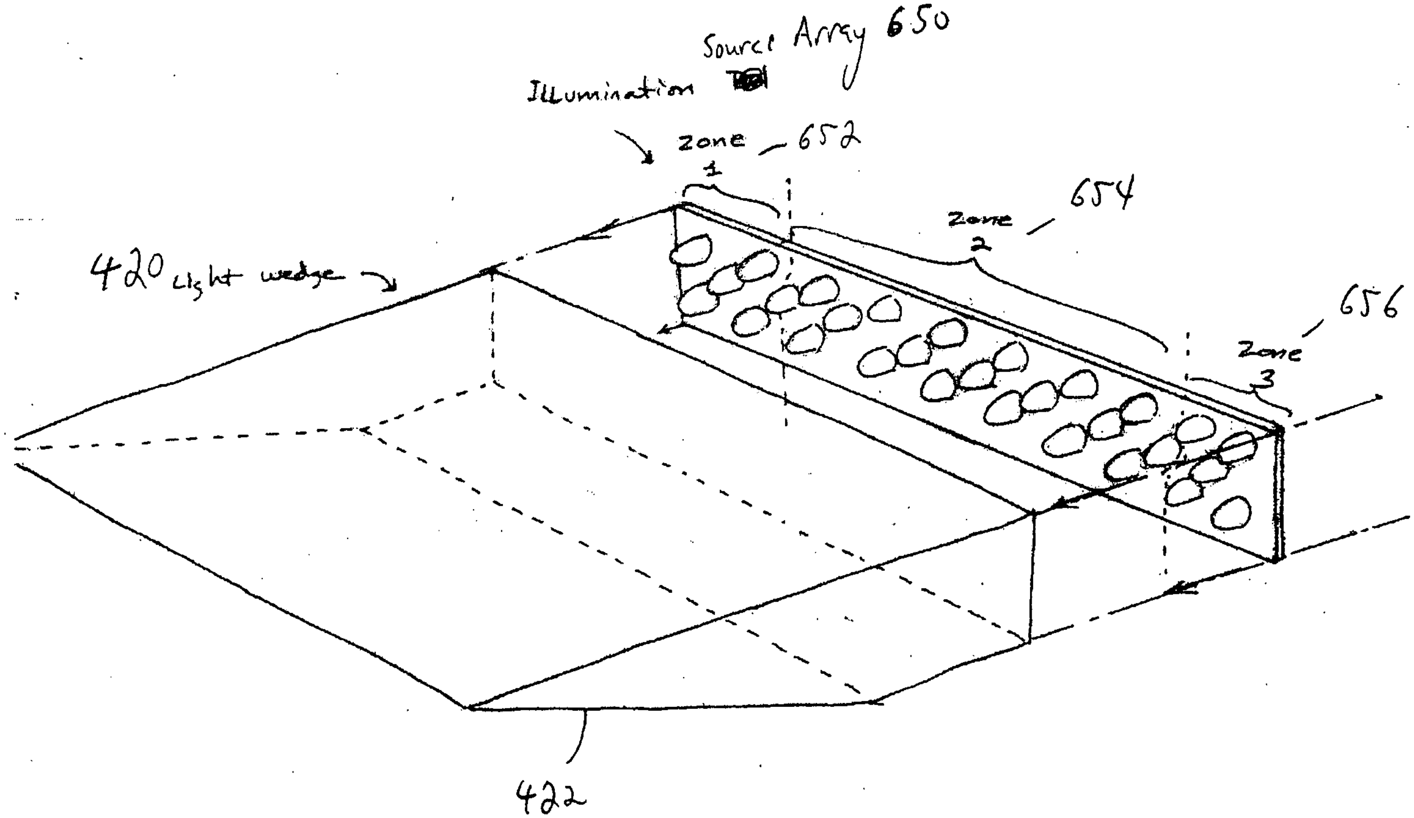

Illumination Source Array 650
zone 1
652
Zone 2
654
Zone 3
656
420 Light wedge
422

FIG. 6D

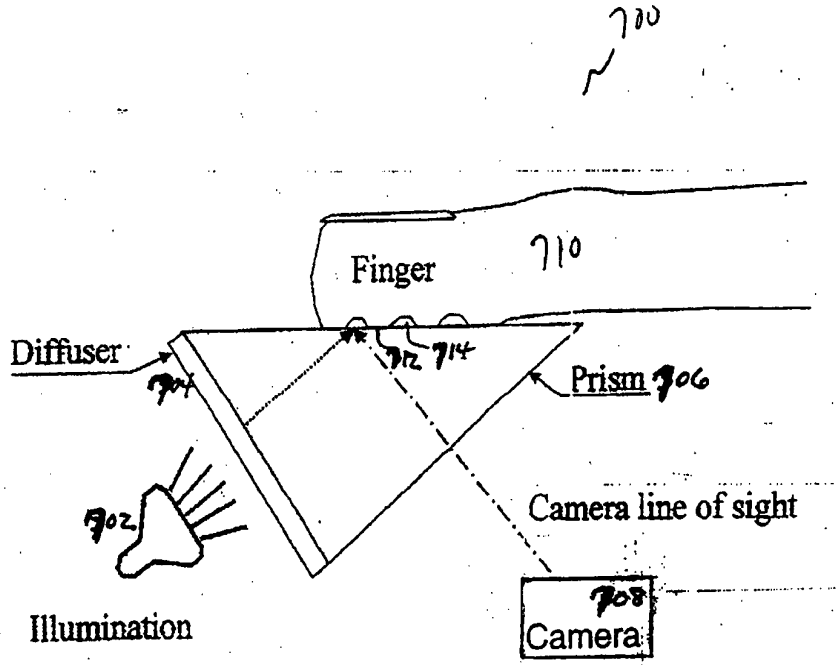

700
Finger
710
Diffuser
704
712
714
Prism 706
702
Camera line of sight
708
Camera
Illumination

FIG. 7

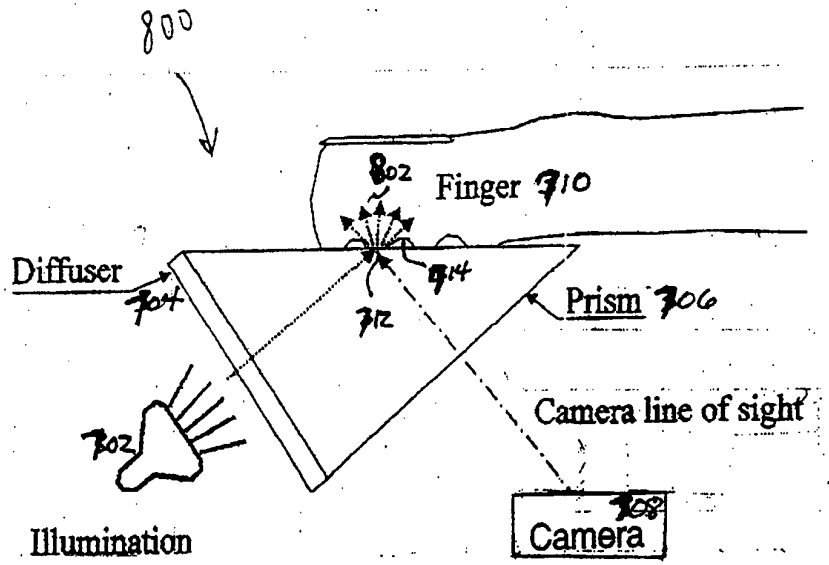


FIG. 8

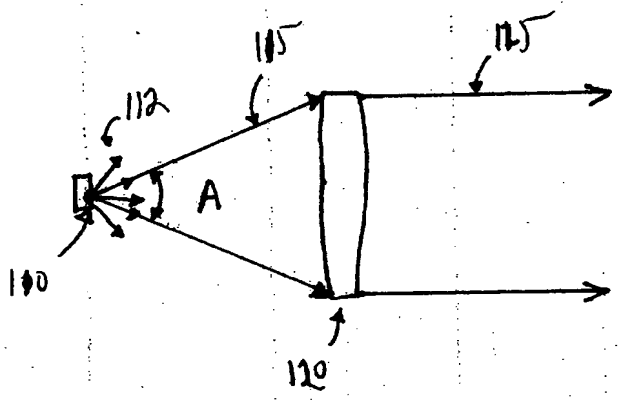


FIG. 1A

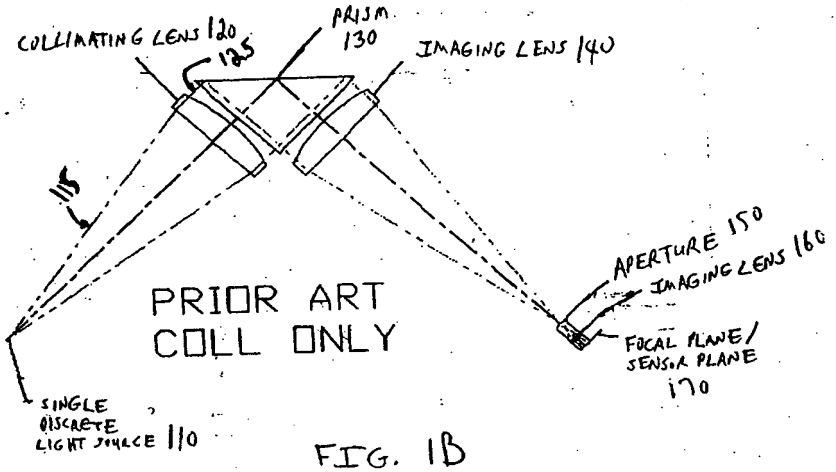


FIG. 1B

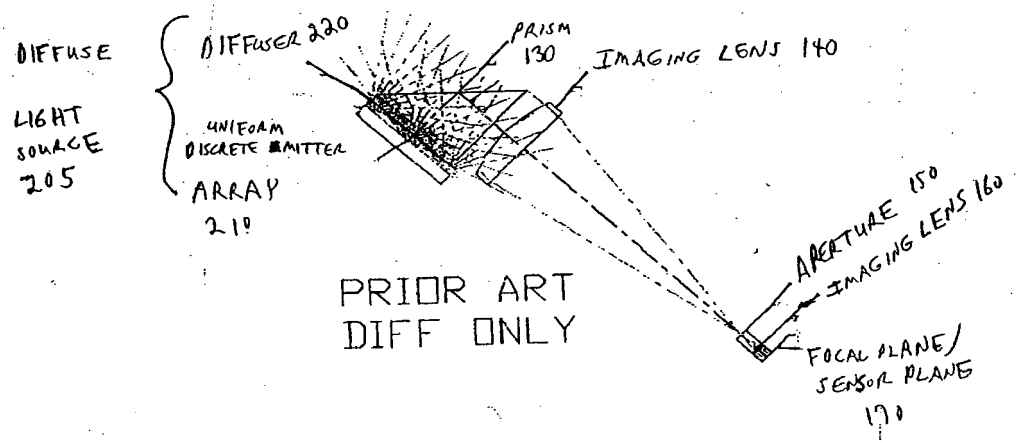


FIG. 2